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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/765,485	01/27/2004	Wen-Liang Hsu	DN2001-239P01	9532

7590 08/10/2005

The Goodyear Tire & Rubber Company  
Patent & Trademark Department - D/823  
1144 East Market Street  
Akron, OH 44316-0001

EXAMINER
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LU, C CAIXIA

ART UNIT	PAPER NUMBER
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1713

DATE MAILED: 08/10/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

10/765,485

Applicant(s)

HSU ET AL.

Examiner

Caixia Lu

Art Unit

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 27 June 2005.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1 and 4-15 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1 and 4-15 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

## DETAILED ACTION

### *Specification*

1. The specification was objected in the previous Office action of March 25, 2005 which resulted applicant's amendment to the specification in the reply of June 27, 2005. Upon reconsideration, the examiner believe that the cancellation of halogen containing compounds of "chloroform" and "carbon tetrachloride" in the Specification Amendment is not necessary because the chloride in both chloroform and carbon tetrachloride are not labile in the polymerization condition. If applicants wish, the cancelled terms, "chloroform" and "carbon tetrachloride", are allowed to reinsert to the specification.
2. The disclosure is objected to because of the following informalities:
  - (i) In Comparative Example 15, page 26, lines 21-22, the "pre-alkylated Nd catalyst" seems mistakenly referred as "co-catalyst". Should the "cocatalyst" be "catalyst" instead? Clarification is requested.
  - (ii) In Comparative Example 17, page 28, line 7, the cited "Example 15" seems erroneous, should "Example 15" be "Example 16" instead? Clarification is requested.
  - (iii) The specification refers polymerization using premixed alkylated Nd catalyst with t-amyl chloride catalyst as Examples such as Examples 14 and 16, while polymerization process by separately introducing alkylated Nd catalyst and t-amyl chloride to the polymerization system as Comparative Examples such as Comparative Examples 15 and 17, wherein the premixed alkylated Nd catalyst with t-amyl chloride catalysts are far more active compared to catalyst composition by mixing the alkylated Nd catalyst and t-amyl chloride in the presence of diene monomers during the polymerization (the

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separately addition of the catalyst component to the monomer containing polymerization media). However, the instant amended claims intend (not require) to claim a polymerization process comprising separately introducing pre-alkylated Group III-B catalyst and halogen containing compound to the monomer containing polymerization media. The instant claims and the contents of the comparative examples are not consistent. Clarification is requested.

***Claim Rejections - 35 USC § 112***

3. Claims 1 and 4-15 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

**Claim 1**

In the third line from the end of claim 1, "the aluminum containing catalyst component" does not have antecedence. The examiner suggests to replace it with -- the aluminum modified catalyst component--.

***Claim Rejections - 35 USC § 103***

4. Claims 1 and 4-14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sone et al. (US 6,130,299).

The instant claims are directed to process for copolymerizing isoprene and 1,3-butadiene in the presence of a Group III-B metal containing catalyst prepared by reacting a Group III-B metal compound such as neodymium neodecanoate with an organoaluminum compound such as trialkyl aluminum to form an aluminum modified Group III-B metal compound in the absence of conjugated diene monomers and then

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mixing aluminum modified Group III-B metal compound with a halogen containing compound such as carbon tetrachloride, wherein both the aluminum modified Group III-B metal compound and the halogen containing compound are added directly to the polymerization reactor.

Sone teaches a method for preparing a conjugated diene in the presence a Group III-B metal containing catalyst obtained by the reaction of Group III-B metal compound, an organoaluminum compound and a halogen-containing organic compound, wherein there is no limitations to the order of addition of those components (col.2, lines 39-59; col. 5, lines 20-28; and col. 6, lines 5-23). Sone expressly teaches that aging the catalyst component with a conjugated diene compound is optional and the purpose of aging is to increase the activity of the catalyst. A skilled artisan would have understood that the aging process would be skipped when the catalyst has desired activity.

Therefore, it would have been obvious to a skilled artisan at the time the invention was made to employ Sone's teaching to conduct the copolymerization of the butadiene and isoprene a process comprising mixing Group III-B metal complex and alkylaluminum first in the polymerization reactor, then adding the halogen-containing organic compound to prepared the catalyst, and then introducing the diene monomers since such is within the scope of Sone's teaching and in the absence of any showing of criticality and unexpected results.

***Response to Arguments***

5. Applicant's arguments filed June 27, 2005 have been fully considered but they are not persuasive.

Applicants argue that the alkylated Group IIIB metal containing catalyst component has superior stability as shown in Example 8 of the specification compared to Sone's catalyst compositions which are stable for a few days as shown in col. 6, lines 49-50. However, such a comparison is immaterial because applicants are comparing Sone's conjugated diene aged catalyst composition with applicants' catalyst composition, there is nothing on the record which shows Sone's none-aged catalyst composition to be stable for only a few days. Applicants need to compare the stabilities between Sone's none-aged catalyst compositions with the alkylated Group IIIB metal containing catalyst component in order to show superior stability of the alkylated Group IIIB metal containing catalyst component.

Applicants also argue that the newly added limitations of separately adding the alkylated Group IIIB metal containing catalyst component and the halogen containing compound to the polymerization reactor differential the process of the instant claims from Sone's polymerization process. The examiner disagrees. When the polymerization reactor is not pre-filled with diene monomers, the alkylated Group IIIB metal containing catalyst component and the halogen containing compound would be premixed just like how Sone's catalyst composition is prepared, i.e., that newly added limitation does not exclude mixing the alkylated Group IIIB metal containing catalyst

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component and the halogen containing compound prior to the addition of diene monomer to the reactor to start the polymerization.

Applicants lastly argue that Sone's catalyst systems are for use in a vapor phase polymerization, while the process of the instant claims is conducted in an organic solvent. However, it is the examiner's position that the processes of the instant claims do not exclude the vapor phase polymerization or the use of silica as the carrier for the catalyst components, the instant claims only require the polymerization to be conducted in a solvent, and a vapor phase polymerization does not exclude the use of a solvent. As a matter of fact, cyclohexane is used as the solvent in Sone's polymerization process as shown in Example 1.

However, it is not note that the halogen containing compound void of labile halogen as disclosed in the instant specification differs from Sone's halogen containing compound which requires a labile halogen. Applicants are advised to file a RCE by limiting the halogen containing compound to be void of labile halogen in the claims, thus, to overcome the rejections under 35 USC 103 over Sone.

### ***Conclusion***

6. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within

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TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Caixia Lu whose telephone number is (571) 272-1106. The examiner can normally be reached from 9:00 am to 5:00 pm.

If attempts to reach the examiner by telephone are unsuccessful and the matter is urgent, the examiner's supervisor, David Wu, can be reached at (571) 272-1114. The fax numbers for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (571) 272-1700.



Caixia Lu, Ph. D.  
Primary Examiner  
August 6, 2005